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GROOMBRIDGE PLACE, KENT.

ESSENTIALS IN ARCHITECTURE

An Analysis of the
PRINCIPLES & QUALITIES
to be looked for in Buildings

By
JOHN BELCHER, A.R.A.

*Fellow and Past President of the
Royal Institute of British Architects*

LONDON

B.T. Batsford, 94 High Holborn

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THE ROYAL INSTITUTE
OF BRITISH ARCHITECTS

IN ACKNOWLEDGMENT OF THEIR
DESIRE TO STIMULATE A POPULAR
INTEREST IN ARCHITECTURE

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PREFACE.

THIS book, being intended for all who are interested in Art, is designed on popular rather than on scientific or technical lines.

It is believed that it will serve a useful end for the professional student by recalling to his mind those first principles and ultimate ideals which are so easily and so frequently lost sight of in the maze of practical details. But its appeal is mainly to that small but ever widening circle of the general public who have both the leisure and the desire to take an intelligent and critical interest in the architecture of the buildings in which, or in the midst of which, they pass their lives, or which they visit from time to time in their country excursions or their ordinary travels.

To be able to recognise and distinguish the varying elements of beauty in a mansion, a church, or a cottage—not to mention our public and municipal buildings; to know *why* this is admirable and

that detestable ; to separate the good from the bad when (as generally happens) both are found commingled in the same example ; to go further still and lay the finger upon the precise difficulty or difficulties which the architect has had to cope with, and to gauge the measure of success with which he has accomplished his task—such a mode of addressing oneself to the study of architecture gains in interest with every day's practice, and often lends an element of pleasure to circumstances and occasions which would otherwise be commonplace and tedious.

In the eighteenth century a discriminating taste in architecture, and a knowledge of its first principles were accounted an essential part of the equipment of a gentleman, but such knowledge and interest as exist among us to-day—outside of professional circles—are for the most part of the historical and antiquarian rather than the practical order.

We too often admire the noble examples of the past without attempting to discover the secret of their glory, to analyse their excellence, or to determine the constituent elements of their beauty and dignity.

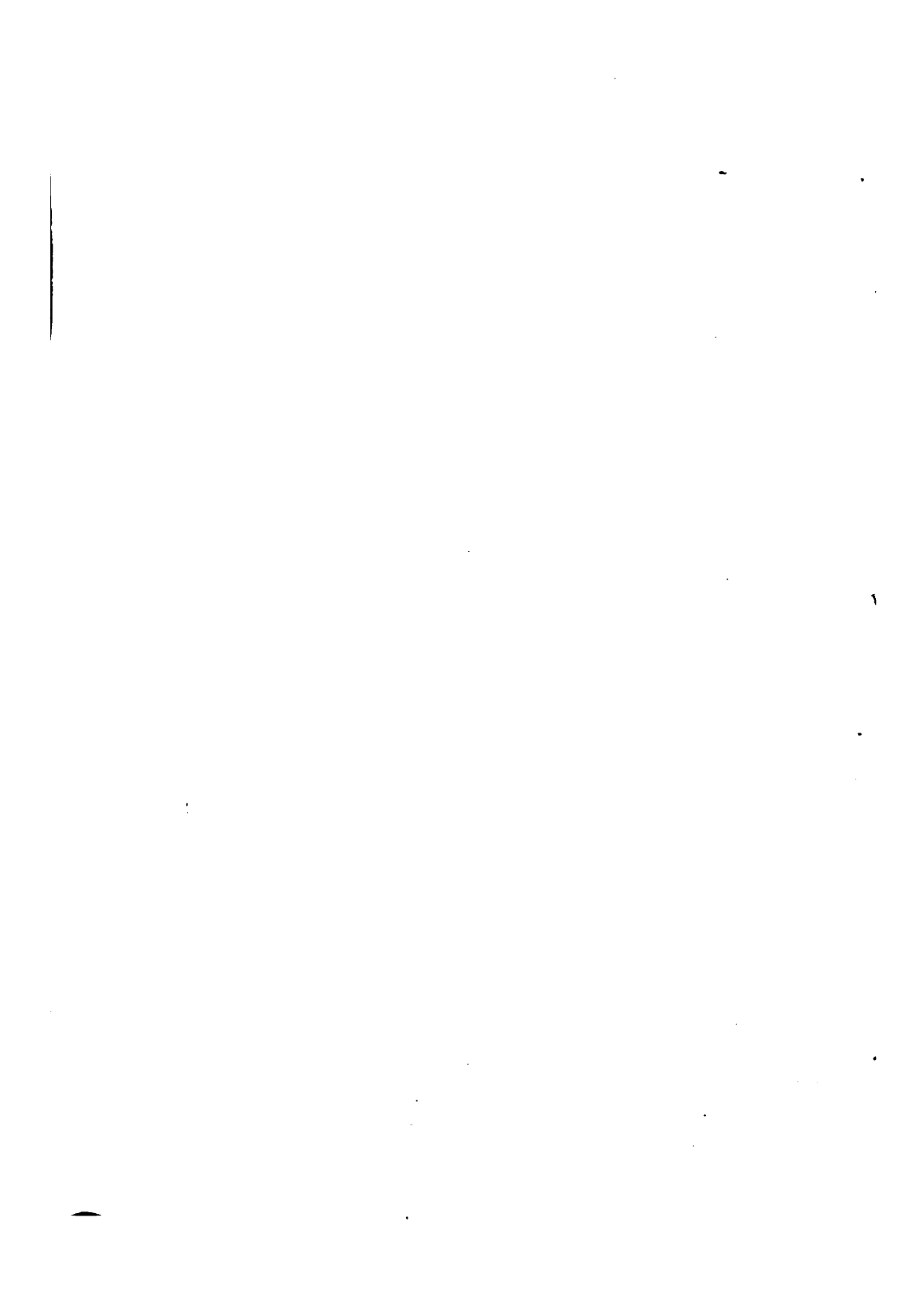
Consequently, a new building calling for the exercise of an independent judgment takes the untrained faculties at a disadvantage. Whether favourably or unfavourably impressed, we are at a loss to assign a reason for the opinion that is in us.

Architecture being an art as well as a science does not admit of exact definitions, but analysis up to a certain point is not only possible but necessary, if interest and enthusiasm are to be intelligent.

The power of appeal of a noble work of art must depend largely upon the innate qualities of the spectator, but the perceptions of the human mind need drawing out, and in the elementary stages call for positive direction.

It is hoped that this attempt to formulate the principles and qualities of architecture in more or less precise terms will introduce an element of intelligent certainty into what too often has been regarded as a mere matter of vague and unreliable taste or even caprice.

The author believes that what is here set forth—illustrated and explained by many very beautiful examples—will serve as a true basis for the development of a refined taste, and therefore also for the creation of a higher public standard of excellence in all that pertains to architecture.



NOTE OF ACKNOWLEDGMENT.

I AM indebted to Mr W. Galsworthy Davie for the frontispiece, the Cottage at Tonbridge, and for other subjects photographed by him; to Mr G. P. Bankart for the House at Clare; and to the Proprietors of the "Architectural Review" for Newgate Prison.

I also have to thank my Publisher for his kindly interest and for some examples from "Later Renaissance Architecture" (edited by Mr Macartney and myself), and for other views.

Mr Horace Dan has taken specially the Keystone and Gates at Hampton Court, Fribourg's Shop in the Haymarket, the House in Soho Square, the Suburban House, and the London gates.

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ESSENTIALS IN ARCHITECTURE.

INTRODUCTION.

ARCHITECTURE has not yet found its true and proper place as a subject of popular interest, in spite of the fact that it may be made one of the most fascinating of pursuits and fill a gap just where literature, painting, and music fail.

In the first place, it meets us on our travels, and often provides an objective for our walks or our tours.

In the next place, examples for study abound both at home and abroad, and, though thoroughly good examples worthy of careful and prolonged investigation are not so general, yet such when found will repay many a visit.

But even in our streets and along our country roads there are usually many buildings which, regard being had to their purpose and position, are not unworthy, and at any rate afford scope for the trained perceptions and critical faculties of the visitor or chance wayfarer.

Architecture taken up, as it should be, from a practical point of view, presents almost an infinitude of varying features and conditions, and calls for the exercise of a living intelligence as well as a refined taste.

Unfortunately, in the popular as distinguished from the professional study of architecture, the range of interest has been limited and the development of a true critical faculty checked by an almost exclusive devotion to that which is ancient or at any rate not modern.

All eyes have been turned—and rightly so—to the glorious monuments of the past for models of all that is most noble and beautiful in architecture. But all eyes must not be riveted there for ever.

The 'classics' of architecture are not the only examples of true and beautiful building. The 'classics,' whether in literature or in art, are a training ground for perceptions and faculties for which there is a use to be found on a much wider field.

Not only is there a profusion of good examples of a more modest and less famous order scattered up and down our native land, ready to our hand, as it were—an inexhaustible mine of interest and information; but the very needs and conditions of modern life, particularly in our cities and towns, urgently demand the formation of a strong body of public opinion and the development of a robust and intelligent criticism in all matters pertaining to our present-day architecture.

A living art requires a living criticism. True

it is that the last century or so has witnessed a vast amount of servile imitation (not to say mere copying, or worse—deliberate forgery), but supply waits on demand, and there has been a demand for mechanical reproduction of the sort mentioned.

The right and proper admiration felt for noble examples has too often become an unreasoning idolatry for 'styles' that flourished (and waned) centuries ago, and this in turn has degenerated into the ineptitude of admiring what is antique, simply because it is antique, without regard to its real merits or demerits.

In this matter mechanical work and pedantic criticism have acted and reacted on one another, to the great detriment of our national architecture, which, as a living art, is a century behind those other makers, the poets, in casting off the fetters of conventions that have had their day and served their purpose. Now, however, there is every reason to fear that liberty may degenerate into licence.

The building that is going on so rapidly around us is indeed often distinguished by a striving after simplicity and sincerity, as well as an aspiration towards that which is truly great and worthy; but, on the other hand, elements of the vulgar, meretricious, and debased are far too frequent and too conspicuous to be passed over without protest.

Much is dignified with the name of architecture which is only too true a reflection of corrupt social and moral conditions, and which will furnish a ready theme for the satirists of the next generation.

The object of the following analysis is to show

how the study of great examples of the past may be made to serve the purposes of the present, both for those whose primary object is an intelligent and cultured appreciation of architecture as a fine art, and also those many others whose interest in such a subject is, by reason of their circumstances and responsibilities (in many cases official), compelled to be of a very practical and business-like order.

To indicate the true nature and function of architecture, to give an insight into the conditions that have to be met and the ends that have to be attained, and to outline the essential, we might almost say eternal, principles which govern the art—in other words, to analyse and distinguish those elements which are common to all good architecture, be it ancient or modern, Classic or Gothic, foreign or English: this is the special purpose that is kept in view and, the writer hopes, is continually presented to the reader in the following pages.

The subject is not approached either on the historical or the scientific side, but a few words of explanation as to these two modes of considering architecture and their relation to the point of view here adopted will not be amiss.

The study of architecture may be treated as a branch, and a most attractive branch, of historical research, either for the light that it casts upon the men and manners of past ages, or for the fascination that always attaches to the study of origins and the tracing of development. There has been evolution in man's architecture as in that of the Almighty Creator of the universe.

Nothing is unrelated to what has gone before, but neither is it a mere repetition of what has gone before. Nothing is really wasted. A species or kind may die out and the worker seem to hark back to a long-forgotten type, but as long as there is life there is growth, and close scrutiny will detect an element of the new grafted on to the old, some new treatment or combination of old forms, or some tentative movement in the direction of a new development.

The conditions of life, both mental, moral, and material, change sometimes slowly, sometimes rapidly, and architecture responds thereto. But the essential principles of architecture are unchangeable, and the student who takes up the subject from the historical side has a rare opportunity to separate the shifting and variable features from those more stable elements and qualities which fall under the old theological definition of orthodoxy, "*Quod semper, quod ubique, quod ab omnibus.*" It is this 'permanent residuum' that we are here concerned with, and from which we propose to draw out our tests of orthodoxy for application to modern buildings.

As regards the relation of the scientific side of architecture to the artistic it is of the first importance to make it plain that though the two may be considered apart, they are practically inseparable. Architecture is not a science plus art, but a science interpenetrated in all its methods and applications by the true spirit of art.

It is not sufficient that a building be constructed

of good materials, that all the supports and abutments be carefully provided for on a mathematical basis, that the doors and windows be conveniently arranged, that sufficient light and air be admitted, that the interior plan be well thought out and adapted to the purpose of the building, that all the sanitary arrangements be perfect, and so on. The architect has to provide for all this and do it all in such a way that the building as a whole, and its various parts and features in detail, may be expressive of the truth and beauty of life, and may serve to "raise the thought and touch the heart" of all who look at it.

For all good architecture addresses itself to the emotions as well as to the mind, and is in the highest degree educative, drawing out what is best and noblest in men. This, however, can never be attained by the mere addition or introduction of certain decorative features.

A building, however sound and good on the scientific side, can never be elevated to the rank of architecture by simply dressing it up in ornament.

The artistic spirit must be at work from the very first.

Recognising and bowing to the practical necessities of life, it moulds, adapts, and combines all its requirements into forms of beauty; *e.g.*, doors and windows are necessary; the architect's first consideration must be the convenience of those who are to use the building, but the condition of his success as an architect is that he achieve this end, and at the same time so arrange and design

the openings in relation to other parts, and to the whole, as that the result is beautiful.

The history of the past shows that some of the most beautiful features in architecture have not been (primarily) introduced as ornamental, but have been the outcome of a practical need or a scientific law, *e.g.*—

1. The projecting eaves to shelter from storm, or (as in southern lands) from the glare of the noonday sun.
2. The round or pointed arch over an opening, because of its strength of resistance to a super-incumbent mass.
3. Mouldings and sills to prevent the moisture running down the windows or front of the building.

Indeed it will be found that nearly all, if not all, beautiful features in architecture have originally been designed to serve a very practical and necessary purpose.

This will serve as an illustration of the spirit of the true architect. The artistic element must neither override the practical and scientific, nor yet be merely superimposed upon it, but must work with it. The two aspects of his work are so blended, that though they may be distinguished in thought, they cannot be separated in operation. It is, then, not so much the matter as the manner that constitutes the difference between good building and architecture; *e.g.*, provision has to be made for the carrying off of rain water; this can be very simply and effectually arranged by a mere mason or

plumber, but to do it in such a way that the pipes and their heads (or receivers) form an integral part of the composition, and an element of beauty in combination with other features, this is the work of the architect.

The *scientific* side of architecture, requiring, as it does, a considerable amount of technical knowledge, does not lend itself to treatment in a popular way, and will only be touched upon from time to time as it merges in the artistic.

Architecture as a fine art is our theme, and will be considered under the three heads of Principles, Qualities, and Factors.

The line that is drawn between Principles and Qualities may seem arbitrary to some, but in this matter we are under a similar disability to that which Mr Ruskin felt when he tells us that he had a difficulty in preventing his Seven Lamps of Architecture from becoming "eight or nine, or even a whole vulgar row of footlights."

Art does not admit of mathematical precision or scientific exactness; it has to do with Ariel-like elements of thought and beauty, which "visit with inconstant glance each human heart and countenance."

Precise rules and dogmatic definitions are not to be expected; but a careful study of good examples in the light of experience and criticism will—it is hoped—awaken the perceptions of the student and stimulate his imagination, that he may be put in the way of seeing rightly and judging truly for himself.



1. OLD NEWGATE PRISON.

CHAPTER I. PRINCIPLES.

TRUTH.

THE first great principle that must be sought and required in architecture is truth, by which we mean harmony with the laws (whether moral, æsthetic, or scientific) on which the strength and beauty of the universe are built up.

Good architecture never deceives the eye, even for a moment.

Nothing must appear to be other than it is. There must be no false statement or suggestion either in regard to the purpose or construction of the building, nor should there be any hiding under one external feature that which is usually expressed by another. A smoke-flue should not pretend to be a supporting column or buttress and pinnacle. A church must not be like a town hall, nor a town hall like an assembly room. The character of the building must be true to the purpose for which it is designed.

A church, whether it be of Gothic or Classic design, should express its ecclesiastical purpose. Its spire, steeple, or tower will differ in character from that of a secular building; so also will the treatment

of its windows and doorways, its ornamentation, and even its roof.

Again, in a town hall the dignity and importance of official life should be indicated by a certain largeness of scale, and by the symmetrical and stately arrangement of its various parts. The nobleman's mansion may be equally impressive and no whit

less in size and importance, but its domestic purpose finds true expression in a quieter disposition of parts, less display of ornament but greater refinement of detail, and in reposeful effects of horizontal lines.

This difference between public and private buildings should always be looked for, and the purpose of the building made clear in every case.



2. IMITATION ELIZABETHAN HALL.

An excellent illustration of truthful expression of the purpose of a building was to be seen in the stern and impressive features (see Example 1) of the Old Newgate Prison (now pulled down). Its rough outlines and rugged stones—suggestive of great thickness and strength—were uncompromising in the severity of their meaning.

Any form of deception is a departure from the principle of truth in architecture. The imitation of old work, for instance, with its crudities and irregularities, is false in art. It makes pretence of an antiquity which does not really belong to it, and a building in this manner may suggest that it was a fortress in the times of the Wars of the Roses, or a disused monastery converted to secular purposes. By any except the initiated the hall in the illustration (Ex. 2) might be taken for Early Elizabethan, but it is only a clever imitation.



3. PALAZZO QUARATESI, FLORENCE.

The use and disposition of the different materials in a building must exhibit regard for truth and fitness.

The stronger and coarser material must be employed for the support of the lighter and weaker,

as illustrated in the Palazzo Quaratesi (Ex. 3) at Florence, where the plaster-covered brickwork of the upper storeys rests upon an unmistakably strong base of rough-hewn stone. The fitness of granite as a foundation material is easily recognised. Its density and hardness are so obvious that the eye is



4. PORCH OF S. MARIA DELLE GRAZIE, AREZZO.

satisfied it can carry great superincumbent weights without being crushed.

Marble, bricks, timber, iron, all have their true place and use, and nothing but confusion arises from their misapplication.

It is not sufficient that a building *be* strong and secure ; it must present the *appearance* of strength and security.

It would be wrong, for instance, to build a storey in granite upon the top of a half-timbered house, though the timber might be quite strong enough to carry the weight; for such a procedure would be reversing the true order of things and produce a sense of incongruity, if not of danger.

The methods of support and resistance should be clear and well defined. The eye must be satisfied with the appearance of the perpendicular supports, and with the means adopted to prevent lateral spread.

Those who realise that 'the arch never sleeps' will want to see sufficient abutment on either side to counteract the outward thrust. So imperative are the demands of the eye that a tie-rod is sometimes introduced (something like the string of a bow) to prevent the ends from spreading outwards,



5. MONUMENT OF MASTINO II., VERONA.

even when such a device is rendered unnecessary by other precautions.

In the church at Arezzo from which the illustration (Ex. 4) is taken, the angle column would scarcely stand without the tie-rod.



6. A HIGH BUILDING, NEW YORK.

In the case of the canopy of our Albert Memorial, the thrust and spread are guarded against by an internal construction of iron, but it is a question whether the eye would not be better pleased if the tie-rod were there, as in the somewhat similar monument (Ex. 5) at Verona.

An engineer may be satisfied with the minimum of material consistent with strength and safety, but an

architect has to see to it that a building is not only sound and good on the scientific and practical side, but also satisfies the spectator's sense of truth and fitness.



7. THE "FULLER" BUILDING, NEW YORK.

It is, above all, imperative that this essential element of truth should be exhibited. It cannot be said that a slight steel structure—however safe it may be—covered externally with a thin shell or



8. A MODERN SHOP.

casing in a material intended to appear like solid masonry, complies with this requirement. This method of construction will be understood by a reference to Ex. 6.

The engineer may know by exact mathematical calculation that a small steel column or stanchion is quite adequate support for a heavy brick wall or for several storeys, but such a triumph of exact science is apt to make the beholder shudder. However much one may admire the skill and ability exhibited in the Fuller Building, New York (Ex. 7), yet, architecturally, such a building stands condemned as pretending to be what it is not.

In architecture—where science is allied with art—not merely must the materials in use be sound and capable of supporting one another, but their relative positions must be appropriate, and their combination must express the purpose of the structure.

It is quite evident that the conditions are untruthful which make a building appear to be standing on a sheet of plate glass, as if it were suspended in the air. (See Ex. 8.)

In all the elements of good architecture it is truth which is paramount, and in proportion as this is faithfully presented will the building impress the beholder.

BEAUTY.

The spirit of beauty, which Shelley describes as “dear and yet dearer for its mystery,” is the second great principle of architecture.

It is a very elusive principle, and despite the many efforts that have been made to determine its



9. CHIESA DELLA SALUTE, VENICE.

essential nature, it still remains 'dearer for its mystery.'

Keats in well-known lines makes it one with Truth, and it is not improbable that it is related to truths that are beyond the ken of human intellect, or at any rate defy analysis.

Its power is to kindle the imagination and purify and stimulate the emotions.

A noble building of imposing mass and graceful outlines strikes deep and solemn chords in the human heart.

What visitor to Venice has not been moved beyond expression at sight of the stately beauty of the Chiesa della Salute! (Ex. 9.) It is not the mere size of the building that makes so great an impression, nor yet its grand scale, though we can easily discover how the latter is enhanced by the relation of the different parts to the whole and to one another. What an effect of grace and vitality is produced by the forms of the buttresses with the figures above!

But it is not in these or other qualities that might be named, it is in their perfect combination that the secret of the beauty of the Chiesa della Salute is hidden. Rising from the water's edge it tapers upwards with perfect outline in every stage of its height from widespread base to the figure which crowns the cupola!

The Loggetta of Sansovino at Venice, from which our next example is taken, was, alas! destroyed in the fall of the Campanile of St Mark's. It was an admirable instance of the union of beauty

of colour with beauty of form. Delicately toned marbles, bronze gates (see Ex. 64), and carvings of great beauty of line and marvellous finish combined with exquisite proportions to delight the eye and instruct the mind of all who saw it.

The small portion of it containing a beautiful Statue of Pallas, illustrated in Ex. 10, is a wonderful study in proportions. The niche in which the statue stands is admirably proportioned to the figure. The latter gives 'scale' to the supporting columns on either side, and smaller figures set in panel-like enclosures serve to make the statue itself appear large, while such other figures and ornaments as are an integral part of the architectural scheme, are, as they should be, on the same scale as the statue itself.



10. THE STATUE OF PALLAS, THE LOGGETTA, VENICE.

The diagrams illustrate the arrangement of particles in three states of matter:

- Solid:** Particles are arranged in a regular, repeating pattern, representing a crystalline structure.
- Liquid:** Particles are arranged in a disordered, irregular pattern, representing a non-crystalline structure.
- Gas:** Particles are arranged in a highly disordered, irregular pattern, representing a non-crystalline structure.



11. THE PYRAMIDS.

CHAPTER II. QUALITIES.

STRENGTH.

IT was Sir Christopher Wren who said that "a good building ought certainly to possess the attribute of eternal." A building should certainly be constructed to endure and survive the shocks of time. It must also have the *appearance* of strength. Like the everlasting hills (or man's counterpart, the Pyramids of Egypt) it must appear to be solidly planted on the soil, and indeed to take hold of it.

The strength of a tree is in its roots, and the width of its trunk as it rises from the ground is

proportional to the weight of the branches it has to support. So a building which is to present an appearance of vitality will suggest a growth from a strong base.

The largest and firmest parts and details will be seen in the lowest stage, while the upper stages will be found to increase successively in lightness and delicacy.

In addition to largeness of form and detail in the lower stage the idea of strength is also conveyed by the use of the strongest material. Granite, for instance, is suggestive of strength and solidity, and the size of the blocks in which this building material can be obtained adds to the impression of security and firmness. When used with judgment, granite renders most effectual aid in convincing the eye that everything placed on it is safe.

Again, the material used can be *treated* in such a manner as to heighten the impression of strength.

If the blocks of granite or other stone used for support are left 'rough-hewn,' that is, with the exposed parts not finished off to a smooth surface, but left rough as though broken out of the quarry, they suggest a house built upon the solid rock.

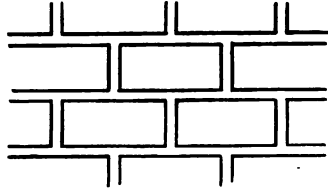
A stone wall with a plain smooth surface may be equally strong in fact, but it does not present the same appearance of strength. Such 'ashlar work,' as it is technically called, may, however, be so treated as to convey a correct impression of its solidity and security.



12. THE RICCARDI PALACE, FLORENCE.



Let the joints in the stonework be marked by a channel, thus—



and an impression of thickness is at once produced, and the wider the channel joints the greater the effect.

The suggestion made to the eye and mind by such a treatment of the material is that the blocks are constructional and are of the thickness of the walls.

Bearing this in mind, the observer will easily distinguish between the true and the false use of such a treatment.

We may see in the Palazzo Riccardi (Ex. 12) at Florence an excellent example of the methods referred to. On the ground floor, rough-hewn blocks with deep and wide joints; above, smooth stone with channelled joints lighter than those below; and on the top floor, plain joints, not channels. Note also how the single large arch below gives place on the floors above to a couple of smaller arched openings of lighter treatment.

A good example of the treatment of stone joints was to be seen at Old Newgate, where it appropriately signified great strength and severity.

In the Debtors' Door (Ex. 13) one is struck by the huge massive plinth and the narrow doorway.



13. THE "DEBTORS' DOOR," OLD NEWGATE.

The latter is made to look smaller than it really is by the size of the stones (with a deep reveal) of



14. BERNINI'S COLONNADE, ROME.

which it is built up and by the three head stones. The upper stage (separated from the lower by a thin band) is built of smaller stones, and in this way a double advantage is secured—firstly, the upper stage itself is made to look higher than it really is, and secondly, the lower stage by contrast is made to look more imposing.

The reader may also be referred to the illustration of the Palazzo Pesaro, Venice (Ex. 38), which presents a wonderful appearance of strength (not unmixed, in this case, with some of the decorative features of architecture) in its ground floor.

VITALITY.

Good architecture should show evidence of life, and the methods of construction be such as are expressive of vitality and growth. This suggestion of life will make itself felt in many subtle ways.

The conventional treatment of the evidence of life in the world around us furnishes the necessary architectural symbols. There is even some analogy between the human form and the column or pillar, with its capital or head and base or foot. Sometimes the columns are in pairs or marshalled in rows, like men in military formation, and the mind by association is impressed with the thought of the dignity and state proper to the purpose of the building.

Take as an illustration Bernini's Colonnades (Ex. 14), enclosing the approach to St Peter's, Rome, where the general effect is that of the mili-

tary holding a line of route, with the guard doubled at the passage-ways.

Or turn to Ex. 56, and study the wonderful impressiveness of the long line of pairs of columns in the front of the Louvre there illustrated, in which (again) many authorities are disposed to see, if not the work, at any rate the influence of Bernini.

But the most striking suggestions of vitality and growth in architecture seem to follow the analogy of trees or plants, which, rising from a base rooted in the soil, lift up tapering branches to the skies, and clothe them with the luxuriance of leaf and flower.

This figure or form of life is easily recognised in Gothic work (especially cathedrals and churches), where shafts and ribs rise perpendicularly from base to vaulting (see Ex. 15), or (as in Ex. 16 and 17) externally lose themselves, as it were, heavenwards in pinnacles and crocketed terminals. In the Palais de Justice, Rouen (Ex. 16), the enriched and decorative treatment of the upper stages, and particularly the profusion of ornament in the parapets and gables, is powerfully suggestive of the luxuriant growths seen in the realm of nature.

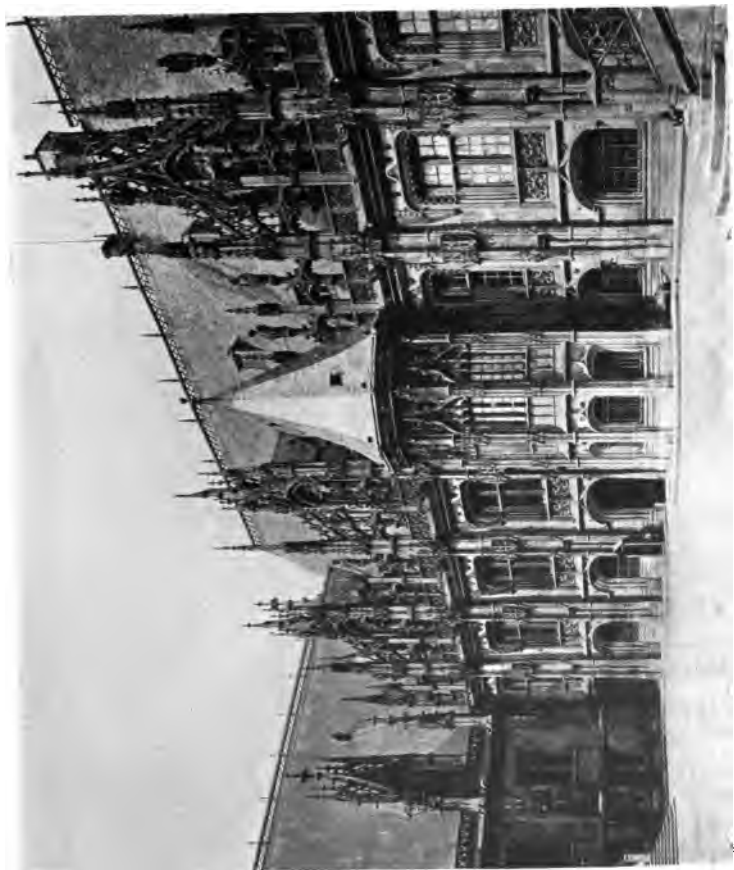
The delicacy of similar features in the Cathedral at Milan (Ex. 17), especially the pinnacles that seem to grow from the flying buttresses, vividly call to mind the long grasses of the field.

An almost startling expression of life is to be seen in the Tabernacle (by Adam Krafft) in the Church of St Lawrence, Nuremberg (Ex. 18), which seems to be growing where it stands, for having reached the groined roof, it is actually turning

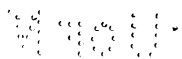


15. THE NAVE, WINCHESTER CATHEDRAL.





16. LE PALAIS DE JUSTICE, ROUEN.



over like a living thing which has met with a slight obstruction.

Architecture should be seen following nature in



17 MILAN CATHEDRAL.

these indications of life and growth. Moreover, in nature there is to be observed an endless variety of expression by the same means. No two trees, though both consisting of trunk, branches, twigs

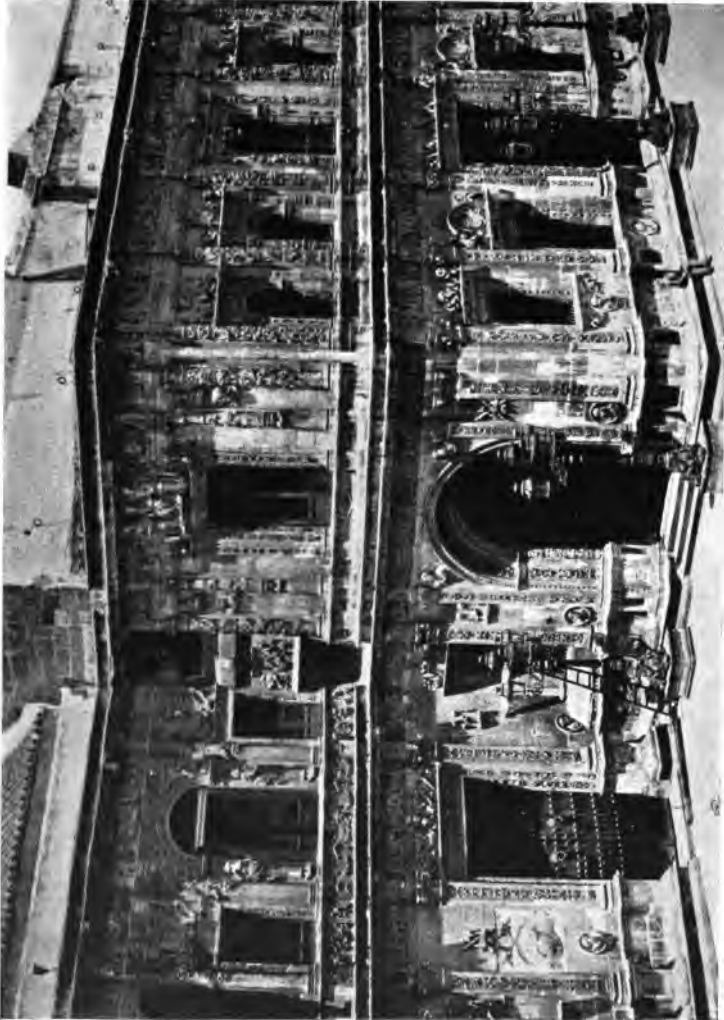


18. THE TABERNACLE, ST LAWRENCE,
NUREMBERG.

and leaves, are exactly alike. Again, nothing is more wonderful than the human countenance, which, consisting always of the same features, presents infinite differences in form and expression.

So in architecture there should be found ever new combinations and effects presented by accepted forms and materials.

Occasionally there may be small tentative departures, variations from type, such as are found in nature. This also is an evidence of vitality, assimilating and adapting some means to meet a special need or putting



19. THE TOWN HALL, SEVILLE.

forth fresh powers where a strange environment insists upon a new development.

There is another evidence of life which should be looked for in good architecture: every building should have some message to deliver, some information to convey as to its purpose or any special circumstances of interest connected with its erection. The building should 'speak' to us, as it were, in a living tongue.

When buildings are erected in imitation of old work, or are merely reproductions of certain so-called 'styles' of architecture belonging to the past, they may be said to speak in a dead language, and lack the charm and interest which belongs to living things.

RESTRAINT.

Whatever be the purpose of a building, there should be no feature, ornament, or line which has not a definite end or meaning or which is not an integral part of the architectural scheme. Thoughtless profusion of ornament is like 'the multiplication of words without wisdom.' The language of architecture should be simple and direct; undue emphasis or unrestrained ornament only serves to mar its beauty and diminish its power.

This lack of restraint may be observed, for instance, in the Town Hall, Seville (Ex. 19), which, in spite of the extreme beauty and delicacy of many of its details, is overloaded and, as it were, 'dressed up.'

Contrast with this the quiet dignity of the Palazzo Bargellini, Bologna (Ex. 20), which, though at first sight simple even to plainness, will be found to 'grow upon' us and to remain a beautiful thought in our minds long after the Town Hall at Seville has vanished from our recollection.

The wall surface is left quite plain, and there is a concentration of ornament about and above the entrance, where the figures on either side form a support to the stone balcony, and the shield above the centre window opening on to the balcony is used to indicate the family of the owner. Every ornamental feature has its definite purpose quite apart from its decorative fitness, and the plain wall surface gives an increased value to the window openings and entrance doorway.

A striking illustration of restraint in architecture will also be found in the gallery in which is exhibited Michael Angelo's "David" at Florence (Ex. 24). No carving, no ornament, the pure architectural lines contrasting admirably with the curved and flowing lines of the sculpture—sculpture (be it borne in mind as an illustration of an important principle), which is *exhibited* and does not form part of the architecture.

REFINEMENT.

Refinement is impossible without restraint; but it means more than mere restraint—it includes absolute purity of form and perfection of material.

Everything must be the best of its kind and at

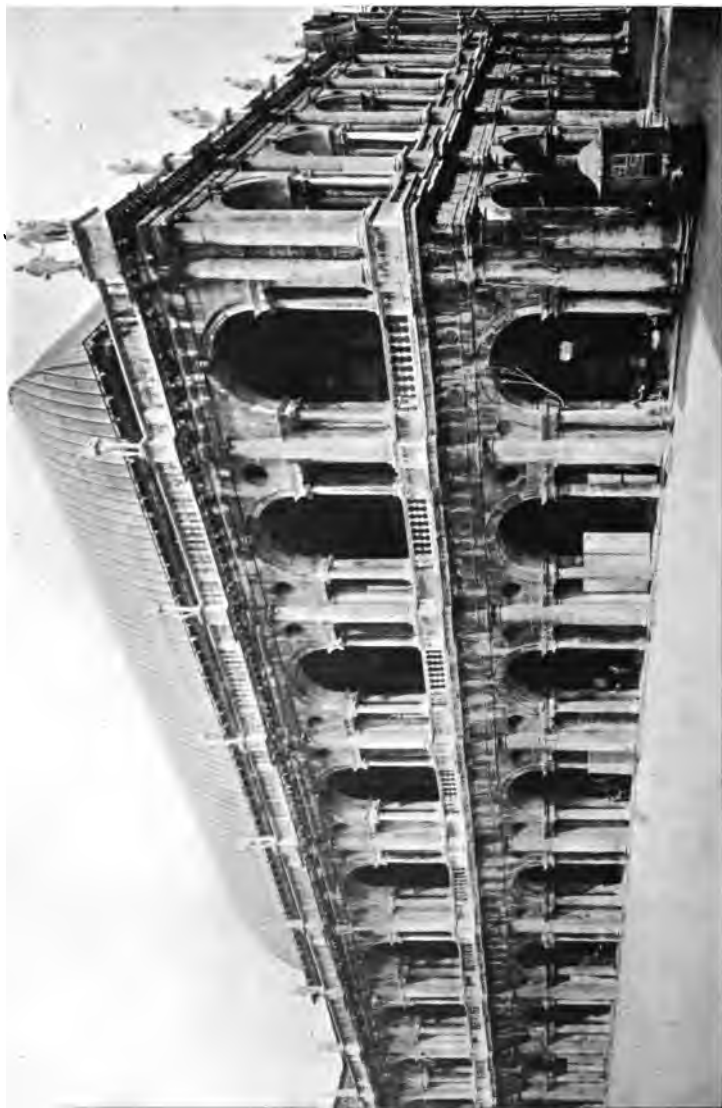


20. PALAZZO BARGELLINI, BOLOGNA.

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21. THE BASILICA, VICENZA.

the same time so suited to its purpose and place that it appears inevitable. Extravagance of any kind, whether in the use of unduly costly material or excess of ornament, is as inconsistent with refinement as anything approaching to the frivolous or gaudy.

May we not perceive something of this refinement in Palladio's Basilica at Vicenza (Ex. 21), even though it is impossible for such an effect to be adequately conveyed in a mere picture? Among the elements that contribute to it in this case may be mentioned a beautiful stone most carefully selected and most accurately jointed, purity of form and detail, a perfect restraint in the matter of ornament, and, behind all, refined thought and simplicity of purpose. The double range of detached columns to the arches in each bay is most effective. The sunlight playing between them adds to the appearance of delicate refinement, and the deep shadow behind throws out in relief the exquisite proportions of the arched openings.

As an evidence of refined simplicity of purpose it may be mentioned that the open galleries seen in the view are built around an old Gothic hall, an arrangement that has much to recommend it. The main hall is on the upper floor and opens on to the galleries, to which there are staircases at the sides. The angle bay is only the width of the corridor, and this lends an appearance of strength which is further increased by the solidity of the double columns at the corner.

REPOSE.

Every really good architectural work is clothed, as it were, in an atmosphere of repose.

We have pointed out that architecture 'speaks,' that the forms and details it employs are, like words, symbols used to express a thought. If we may carry



22. TEMPLE OF NEPTUNE, PAESTUM.

the simile a little further, we may say that the building that talks too loudly or too insistently is lacking in repose.

There can be no repose where there is even a touch of vulgar exuberance or self-advertisement. Repose is based upon quiet strength and an assured position.



23. GRAN GUARDIA VECCHIA, VERONA.

Perhaps the abstract quality here indicated may be most easily discerned in the Greek temples, such as the Parthenon, or the Theseion, or in the Temple of Neptune at Paestum (Ex. 22), in which the strongly-marked horizontal construction, particularly as seen in the long lintels resting firmly upon the relatively low columns, not only express repose but even suggest the thought of an eternal sleep.

There is, however, a repose which is alive or even alert. Take, for instance, such a front as that of the Gran Guardia Vecchia, Verona (Ex. 23). Instead of the



24. ACCADEMIA DELLE BELLE ARTI,
FLORENCE.

flat lintel on columns we have a row of 'live' arches, with, however, a strong abutment at each end to hold them in restraint. Then the stately line of double columns on the upper stage are like soldiers standing

at attention. There is also a curious suggestion of watchful repose in the bowing form of the two shields that crown the front.



25. PALAZZO MUNICIPALE, BRESCIA.

The third example given of repose is an interior (Ex. 24), a sculpture gallery at Florence, already mentioned, which is devoted to the exhibition of

Michael Angelo's works. How wonderfully the 'setting' serves to give the beauty of the statue of David its full value. Not a single ornament, only pure architectural lines, to throw up, by contrast, the graceful curves of the figure.

The student may also with advantage, under this heading, be referred to the front of the Louvre illustrated in Ex. 56, which will be found to present in marvellous combination the two kinds of repose indicated above (under Ex. 22 and Ex. 23).

GRACE.

A dignified seriousness of purpose should be observed in the appearance of all public buildings, but an expression of the 'grace' of life should not be lacking. This effect is produced by greater purity and delicacy of detail, by ornamental enrichment of constructive features, and by beauty of line and finish. Take, for instance, the Palazzo Municipale, Brescia (Ex. 25), which is given, not as a perfect type, but as possessing for the purpose of illustration elements of grace which may easily be distinguished. The masculine grace of the lower storey contrasts with the more distinctively feminine qualities in the upper, but the pilasters in the latter are almost too slight and delicate for the deep cornice above, with its beautifully carved frieze. Note how the enriched portions of the front are kept distinct and well-defined by the plain surfaces about them.

This element of grace figures, or should figure, largely in the composition of all domestic buildings.

It may be discerned in the illustrations taken from Raynham Hall and Drayton House. In the doorway at Raynham (Ex. 26) note the subtle lines of the curves bowing towards the shield in the 'broken' pediment; also the enriched fascia above the beautiful architrave, and the tall and slender Corinthian columns by which the composition is framed. The refined detail of the windows on either side adds greatly to the dignity of the whole.

The doorway at Drayton House (Ex. 27) is not in itself so beautiful as that at Raynham, but its surroundings—the windows on either side, the pediment and carving above, and the wrought-iron balustrading to the steps—combine to produce a wonderfully graceful effect. Note the more delicate finish to the two side windows, which has replaced the stronger and more formal pediments still seen in the adjoining windows, a variation which has vastly increased the beauty of the whole composition.

BREADTH.

This somewhat technical term is used to denote a certain comprehensiveness of form and firmness of line which is to be seen in every great architectural work.

It has reference to the treatment of the subject *as a whole* in a simple grand manner, to the proper massing of the several parts and the subordination of detail to the larger forms of the composition, and to the bringing of the whole design into unity.

A building may be large in extent and size with-



26. DOORWAY, RAYNHAM HALL, NORFOLK.

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out being broad in treatment. For instance, we cannot expect breadth in a building which has been



27. AN ENTRANCE DOORWAY, DRAYTON HOUSE.

enlarged by small additions made from time to time and linked together as circumstances or convenience

dictated. The result of such a process may be picturesque and possess a charm of its own, but the whole, as a whole, will almost certainly be quite lacking in breadth.

Take, for instance, Hutton-in-the-Forest (Ex. 28), where square-headed openings, Gothic arches, and circular arches are all seen in close juxtaposition, and where the different parts and wings vary in height and size and make no pretence of symmetry or balance. There may be much that is charming and beautiful about such a building, but there can be no such quality as 'breadth' in the architectural sense.

The part of the building (in the view shown) of Hutton-in-the-Forest that is least pleasing is the castellated wing on the left, of the Tudor type. A very little experience is sufficient to suggest that this part is what is euphemistically termed a 'restoration.' For one thing, the windows on the right of it are too close to the angle to allow of anything more than one of our thin modern walls. The wing on the right of the view is the oldest part; the central and recessed portion is the most complete, and is no doubt a seventeenth century frontage to the old building.

'Breadth' is not inconsistent with multiplicity of detail. The walls of the Houses of Parliament, Westminster (Ex. 29), are literally covered with detail and ornament, yet the composition as a whole is distinct in form and broad in treatment. In this case the detail resolves itself into what is technically called 'texture,' which, like colour, lends itself to an increased impression of breadth.



28. HUTTON-IN-THE-Forest, WESTMORLAND.





29. THE HOUSES OF PARLIAMENT.

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A similar effect is obtained, though in a totally different way, in the Doge's Palace, Venice (Ex. 30). Here the vast wall area of the upper stage is covered with different coloured bricks arranged in a diaper pattern, yet the sense of 'breadth' is not impaired either by this treatment or by the many parts and divisions of the lower stage. Indeed, the latter only emphasise the effect of the plain surface above.



30. DOGE'S PALACE, VENICE.

SCALE.

What is known as scale in architecture may be described as the proper relation of the several parts to one another and to the whole in point of size.

It is a technical term which may easily be understood by those who are familiar with the principles

of music. Scale is like a 'measure' which regulates the division of parts in a building, and it is by the right use of the subdivisions (as with the gamut in music) that perfect harmony can be produced. The scale may be large or small, but the intervals are in proportion. The key-note is set and the others are in relation to it.

The architect, like the musician, should so adapt every part of his work as that it may take its place in due proportion to, and in harmony with the leading or dominant motive. The different scales in architecture are as powerful and as distinct in their effects on the eye as the various keys in music are in their effects on the ear.

Or to take an illustration from the art of sculpture. When we have a monumental figure of heroic size,—that is on a large scale,—each part and every limb must be 'in scale,' viz., in right proportion to the whole figure. Similarly, in a building, doors, windows, cornices, architraves, mouldings, &c., should all be in due proportion to one another and the general scheme.

We may illustrate this by referring to the Palazzo Albergati, Bologna (Ex. 31), a building designed on a large scale with all the parts so proportioned to one another and the whole that in the view presented to us, were it not for the introduction of the sentry-boxes—an entirely adventitious feature—we should be without any clue to the real size of the doorways. We should, perhaps, take them to be about 8 feet high, whereas, as a matter of fact, they are about double that height. It is instruc-



31. PALAZZO ALBERGATI, BOLOGNA.

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32. TEATRO OLIMPICO, VICENZA.

tive to note that the columns, cornice, and entablature to the door on the left of the view are in better scale with the huge building than the other entrance, which, owing to its smaller detail, presents the appearance of being somewhat overweighted by the windows above, which is not the case with the nearer door.

To maintain the scale of a building, sculpture can play an important part, for where it forms an integral part of a composition, it must be in due relation to the architecture. If the figures are not in scale with the building both will suffer.

We recognise, for instance, almost intuitively the thorough harmony of sculpture and architecture in the work of Palladio as illustrated in the Teatro Olimpico, Vicenza (Ex. 32). This example will also serve to show how important it is that, where smaller figures are introduced in illustration of some subject apart from the building, they should be framed or set in a panel—like those over the side doorway in the centre of the picture—where they are separated from the general scheme of the architecture.

CHAPTER III.

FACTORS.

FACTORS (viz., the means employed to obtain or express the qualities considered in the preceding chapter) may be classed as follows :—

1. Proportion.
2. Light and Shade.
3. Colour.
4. Solids and Voids.
5. Balance and Symmetry.

These factors, it will be seen, are to be found in the right use and adjustment of the architectural forms that are needed for, or suggested by, the purpose and place of the building—such as window and door openings, floor divisions, porch or other projections and recesses, cornices, string courses, columns, buttresses, chimneys, &c. &c.

All these architectural forms serve a definite end in the constructional needs of the building, and must not for artistic purposes be employed otherwise. They play a most important part on the artistic side, but this part must grow out of their original purpose.

PROPORTION.

We have seen that scale and harmony are essential qualities in good architecture. To obtain



33. CHÂTEAU DE FONTAINE HENRI.

these the architect avails himself of proportional divisions which must be in true relation to one another.

Proportion is entirely a matter of relation ; it is not the actual size but the relative size of one part to another that is of so much importance.

The huge roof of the Château de Fontaine Henri (Ex. 33) might be effective and impressive under certain conditions, but here it seems to crush the building below it, which is thereby made to appear small. The pressure of the wind, too, against these high roofs is very great, as is evidenced in the example before us by the buttresses which have been added to the angle turret to lessen the swaying of the structure.

There are varied divisions and subdivisions in size which, when used with and in true relation to each other, please the eye much in the same way as, in music, certain divisions of sound in combination charm the ear.

In the selection of the scale to be adopted the purpose and position of the building has to be taken into account. A large scale may be necessary for an important building, or one that is designed to be of a monumental character or to be viewed at a distance, and then each part, every moulding even, must be proportionately large. But a large scale is quite out of place in buildings of a small or unimportant nature. The Casa del Diavolo (Ex. 34) at Vicenza—the enormous scale of which may be estimated from the figures in the openings on the ground floor—appears almost absurdly Brobdingnagian in character. It is, however, only a fragment (by Palladio) and was designed for a palace.

It must be understood that the human figure is

the standard by which the eye consciously or unconsciously measures everything.

We have had an illustration of this in the last



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34. THE CASA DEL DIAVOLO, VICENZA.

example ; see also Ex. 26 (Raynham Hall) where it is only the figure in the entrance that enables us to form a correct idea of the height of the doorway. So also in considering the Palazzo Albergati (Ex.

31) we were compelled, in order to judge of the scale, to have recourse to the sentry boxes.



35. THE DELPHIC SIBYL IN THE SISTINE CHAPEL, ROME.

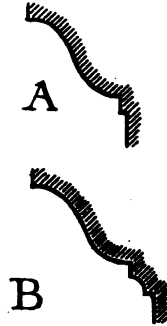
When Michael Angelo desired to represent his Sibyls and Prophets in the Sistine Chapel as giants,

he obtained the effect by comparison, introducing into the composition smaller and subordinate figures (see Ex. 35).

In a similar way, an apparent greater size is given to some parts of a building by smaller but relative subdivisions.

Even with lesser objects like mouldings this principle of proportionate comparison may be observed in good work. For instance the moulding A given in section conveys no impression of size to the eye, but by adding another 'member' (or smaller moulding) to it, as shown at B, then by comparison A appears large.

Without such a method of comparison, mere size will not suffice. It is difficult to form a true conception of the size of St Peter's at Rome when the building is empty, but see it when a crowd of worshippers is assembled and a more correct idea of its vast proportions may be obtained.



To take our analogy from music, St Peter's may be described as a strong unison composition in double octaves without any of the relative smaller divisions of sound.

In the view here given (Ex. 36) some faint, very faint, idea of the actual size of the building may be gained by comparing the size of the man standing near the holy water stoup on the left, with the cherubs supporting the stoup. Their heads appear to be nearly three or four

times as large as that of an ordinary full-grown person.



36. ST PETER'S, ROME.

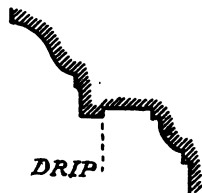
The figures above are of the same enormous size. In the niches on the lower part of the piers supporting the dome all the statues are 16 feet high. Above them are four mosaics of the Evangelists, also of colossal dimensions, and the figure of St John holds a pen 15 feet long!

Where everything is on such an immense scale

it is difficult for the eye to realise the vastness of the cathedral. There is always a danger of a loss of impressiveness where there are no contrasting figures and objects of normal size in juxtaposition.

Again, there is always a point beyond which the mind is not so much impressed as depressed by mere size. This is felt in the presence of some of Vanbrugh's work, *e.g.*, at Blenheim, which has always been regarded as ponderous and gloomy.

In architecture proportional divisions may be either horizontal or perpendicular, or both, according to the size and the needs of the building. To employ again the analogy of music, the horizontal parts will be built up like chords, while the perpendicular divisions may be not inappropriately likened to musical cadences.



That the harmony be true and pleasing is the work of the architect, but the result can be appreciated by those who will study the proportions of the composition.

To obtain horizontal proportions and divisions, cornices, large or small as their position or purpose demands, may be employed. The primary use of these is the protection of the part of the building below them from rain, or sometimes in sunny aspects to afford necessary shade. In the south of Europe the overhanging cornices and projections are, on this account, much larger.

It will be observed that where these cornices (or

combinations of mouldings) are intended to prevent the water from running down the face of the building like tears, there is provided what is called a 'drip' moulding, from which the water must drip, because it cannot ascend the back of this feature.



37. HOUSE AT STEEPLE ASHTON, TROWBRIDGE.

Again, what are called hood-mouldings over windows are provided to keep the rain off the windows. Projecting window-sills are also to throw off the water. Where these cornices, hood-mouldings, or sills are continuous above or below the windows, they become string-courses and 'bands,'

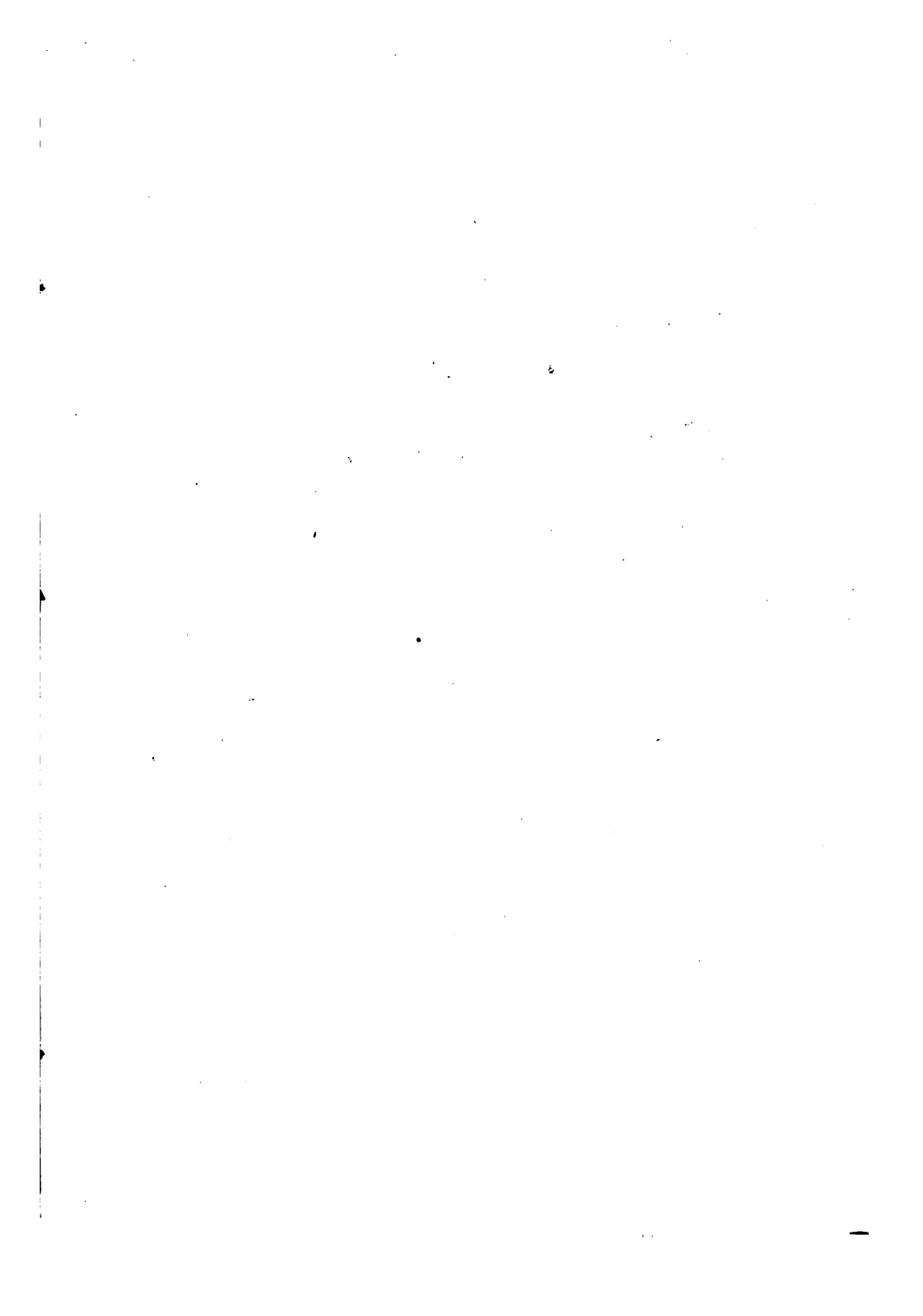


38. PALAZZO PESARO, VENICE.





39. L'ALAZZO SPADA, ROME.





40. CROWHURST PLACE, SURREY.

which may serve for horizontal subdivisions on a façade.

Another method by which horizontal divisions are effected is by a change of material—from, say, a stage or storey in granite to one in stone, or from stone to brick.

The old house at Steeple Ashton (Ex. 37) combines a stone base with timber and herring-bone brickwork (in lieu of plaster) between—thus introducing an effective colour contrast.

Or a change is made in the *texture* of the material employed—*e.g.*, from a base of rough-hewn stone to a finely-worked surface over. This is the method frequently and very appropriately adopted in the Venetian palaces on the canals—such as the Palazzo Pesaro (Ex. 38)—where the lower storey near the water's edge is used for access and as a storehouse, the main residential floors being above.

Another kind of variation of texture is effected by marking out the stone jointing sharply with little channels cut around each stone in its place, as illustrated on page 31. This may be contrasted with a decorated surface above, as in the beautiful Palazzo Spada, Rome (Ex. 39), where the variation of texture serves, with the horizontal bands or strings, to furnish divisions of good proportion.

Another contrast is seen where half-timber work is over brickwork. In England examples of this are numerous, *e.g.*, Crowhurst Place, Surrey (Ex. 40), and the effect is always more satisfactory than where the timbers are carried up from the lowest stage.

Smooth plaster (or cement) work and 'rough-

cast' work form another divisional contrast. In this case, however, it is the smooth that should be below the rough; for the plaster or cement which covers a lower stage of rubble or brickwork is left plain, while 'rough-cast'—made by throwing small pebbles against the plaster while still wet—as an additional



41. HOUSE AT CLARE, SUFFOLK.

security against the weather, is more appropriately applied to timber construction and such other portions as are slight or thin. For the same reason, ornamental plaster should be above the plain, as in the house at Clare, Suffolk (Ex. 41).

The Palazzo Riccardi (Ex. 12) may be referred to as a good example of horizontal division. The



42. WAKEHURST PLACE, SUSSEX.

different stages are not only divided by string-courses, but also vary in texture in the manner pointed out in the description of the example.

The Louvre front (Ex. 56) and the Gran Guardia Vecchia, Verona (Ex. 23), have also strongly marked horizontal divisions.

All these various methods of obtaining horizontal divisions have their practical as well as artistic uses, and in examining them the double test should be applied; and where the architectural forms or disposition of materials fail to exercise their practical function, then their artistic use is not justified, nor can the work be pronounced good architecture.

The comparative height of the several horizontal divisions in a building is a matter depending upon special technical knowledge and must be subject to a variety of circumstances as well as to the character of the design.

Perpendicular divisions, like the horizontal divisions, are secured by the disposition of architectural forms necessary to the construction of the building and the requirements of the plan. The breaking forward or recessing some parts of the building, and the use of columns, pilasters, or buttresses, provide the means for perpendicular divisions, and are made to subserve the purposes of rhythm and balance in the composition.

This is well illustrated at Wakehurst Place, Sussex (Ex. 42), where the perpendicular divisions determined by the requirements of the plan obviously dominate the composition, and where, too,

the elements of rhythm and balance are marked features of the building. . . .

The largest projections are at each end and include the important rooms. In the centre, sheltered between the larger projections, and itself of a projection proportionate to its width, is a porch, while at the inner angles are two bays of still less projection.

The general perpendicular lines are further impressed upon the building by being carried up through the roof to form the dormer windows and higher still by the small finials to all the gables.

Milan Cathedral (Ex. 17) may also with advantage be referred to under this head. Here the buttresses with their pinnacles, together with the long windows between and their mullions, are all insistently perpendicular.

LIGHT AND SHADE.

Effects of light and shade play a not unimportant part in the harmonious treatment of a building. They form a factor of considerable account in the subdivision of its mass, in accentuating its lines and bringing certain parts of it into greater prominence, and thus more forcibly expressing the form of the whole composition.

Such effects may be discerned in the view of Ham House (Ex. 43), where, by aid of the sun, the horizontal line of the main cornice is strongly marked and serves to show up the form of the various projections and recesses. The arcaded shelters at the



43. HAM HOUSE, SURREY.

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44. CARK HALL, WESTMORLAND.

inner angles are also in strong shadow, and these pleasant retreats provide beautiful contrasts of light and shade at all hours of the day. The long shadow which falls across the centre of the building may be seen breaking softly round these arcaded projections and over the bays beyond. These bays are obviously later additions; the wooden sashes and bars frankly proclaim this, the older windows possessing stone mullions and lead glazing. The horizontal stone bands are not continued round the bays, but this cannot be said to detract from the beauty of the house nor its 'light and shade' effects.

As an illustration of the contrast of parts effected by light and shade Cark Hall (Ex. 44) will serve, and is all the more instructive by reason of the fact that there is in this case an entire absence of horizontal or perpendicular subdivisions and the whole composition is dependent upon the strong light and shadow for contrasting effects. These bring out its forms and emphasise the entrance and central feature. There is nothing specially interesting in the building or its details except the doorway, which is most admirably designed for its position and would appear to be of later date than the main building. The beauty of this feature is enhanced by the plain field in which it is set, for the building as a whole is an example of extreme 'breadth' of treatment and of the value of a simple setting to a piece of concentrated ornament.

The amount of projection or the exact depth of a recess will depend upon the aspect of the building,

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for it is obvious that the effects both of light and shade will be stronger on the south side than the north. A recess on the south side may look cool and inviting, while a similar recess on the north side would only produce an impression of gloom.

Moreover, every such projection or recess must have its distinct purpose arising out of the plan and constructional needs of the building. It is the *artistic* employment of means for the realisation of specific ends that differentiates architecture from mere building.

Who does not know some domestic building in the heart of the country where the external projections or recesses formed by the *judicious planning* of the rooms of the house result in pleasant corners and shady nooks under the wide-spreading eaves? Groups of clustering chimney stacks suggest warmth and hospitality, and long lines of ridge and wall contribute to an air of restful seclusion and retirement.

From the almost overwhelming abundance of good examples which our country happily possesses we have selected for illustration (*Frontispiece*) that most charming of country residences, Groombridge Place, Kent, where nature and art seem to have joined hands in making an ideal home. The moat, which encloses a beautiful garden as well as the house, imparts a sense of security and seclusion, and its sides lend themselves to the many-coloured luxuriance of nature's growths. The house, substantially built and well laid out, speaks of happy ease and comfort. But the beauty of the whole can

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only be appreciated rightly by those who have seen the colour effects. With the different shades of red in the bricks and tiles, and their tints often varied by shifting shadows, this delightful home, set in the midst of green foliage and against a dark background of trees, presents a picture not easily forgotten.

COLOUR.

We have already seen how a change in texture of the material may be used to separate parts of a building for the purposes of proportional division. A complete change of the material itself, and consequently of colour, is a still more powerful factor in the hands of the architect.

A change of texture produces a difference of 'tint' on the surface; a change of material means generally a stronger contrast still. Strong contrasts have to be very carefully handled, as workers in all forms of art know well; but a complete change of colour may often be most effectively employed in architecture, not only for the purposes of division, as already indicated, but as a relief to the eye.

Red, white, or black, used singly over a large surface or area, produce an impression of deadly monotony.

The white-plastered cottage nestling among green trees is a most charming effect, but a long range of white buildings unalleviated by colour is quite another matter.

Violent contrasts, on the other hand, occurring in parts of the same building, give it the appearance

of being cut up and restless ; but variations of tint are a most valuable factor in the harmonious treatment of a building.

Red bricks with red tiles of the same shade would be monotonous and altogether unpleasant for a large house, but brown tiles with red brick or green slates with stone (or red brick) may make a most felicitous combination. But how harsh and unpleasant in effect are the ordinary blue - purple slates in common use ! Against the sky they look horrible, and the shade of blue that is in them clashes with every green tree that may be near.

On the other hand, the grey hue of the stone tiles in use in certain districts where stone is abundant is very beautiful, and harmonises easily with its ordinary surroundings.

It is interesting to study the colour effects in an extensive building like Hampton Court. Some of them are due to age and atmosphere, but many also to design. The buildings, whether of earlier or of later date, are all of red brick, but the monotony of the vast area is broken in the older portions by stone dressings in small quantities, and also by the use of vitrified bricks arranged in squares and lozenge-shaped patterns. It is this treatment which imparts to such portions that purple tone which is so much admired.

In the later additions by Sir C. Wren, another variation is obtained by the use of dark red bricks in the base or lower storey and the brighter red of the 'rubbers' above. There is further a more extensive use of Portland stone in cornices, architraves, quoins,

and other features. The central portions—consisting of columns, pilasters, pediments, &c.—being entirely of stone, the red brickwork is thus divided and so modulated as to give the effect of a warm glow over the whole structure.

In the choice of stone account must be taken of the changes wrought by time. Some kinds of stone become very dark, others bleach; some will show beautiful time-stains, others remain cold.

One of our most beautiful stones is the Portland variety, which with time turns a lovely silver grey, equal in effect to the finest marble. St Paul's Cathedral, Greenwich Hospital, and, in fact, most of our important public buildings are in Portland stone.

Again, with stones of different colours, the *depth* of colour has to be reckoned with. Some yellow and brown or red and grey stones in combination do not harmonise, and the 'values' or 'weight' of colour must be considered before they are placed in juxtaposition. This caution holds good also for granite, of which there are several varieties, differing in shade and colour.

As a factor in architecture, colour is much more freely employed in other countries than in this, and (we observe) the sunnier the climate the more brilliant the colour. Plaster and colour-wash are certainly more cheerful than our dull stock-bricks, and serve also (incidentally) to cover a multitude of sins!

As regards the place of colour-treatment in architectural work, it may be safely and emphatically laid down that the essentially architectural element must

take the first place, and painting or colour decoration like sculpture be content to subserve the purposes of the architect.

SOLIDS AND VOIDS.

The adjustment of solids and voids is a matter of great consequence in good work, and, like other factors in design, must grow out of the architectural needs of the building. The voids are, mainly, window and door openings or the open arches of arcades, &c. The solids are the constructional supports, walls, &c., of the building. Constructional piers or other supports should rest upon the ground and not upon an arch or any kind of void.

In the Gran Guardia Vecchia, Verona (Ex. 23), and in the Colonnade du Louvre (Ex. 56) it will be seen that the openings in the upper stage come directly over the archways, leaving the solid piers between the arches for the support of the double columns above.

In many of the delightfully picturesque Italian Gothic buildings of the fifteenth century this principle is disregarded, though the eye may be so cleverly tricked as not to be disturbed by the irregularity.

The Palazzo da Schio, Vicenza (Ex. 45), for instance, has a large mass of heavy brickwork (covered with plaster originally) resting upon the doorway, and the thin arch has no abutments at its springing, but a window opening on either side of it. Time and weather, however, have worn off the



45. PALAZZO DA SCHIO, VICENZA.



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46. PALAZZO MASCARELLO, VICENZA.

plaster and laid bare what is called a 'relieving arch,' which serves to distribute the weight of the mass of brickwork and relieve the pressure upon the arch below.

In another example from Vicenza, the Palazzo Mascarello (Ex. 46), the solids and voids are imperfectly adjusted, yet so cleverly has the work been carried out that the building has suffered little during its four hundred years' existence.

The apparent weakness in this instance is the heavy mass (above the first column on the right) resting on the two arches, one of which, on the left, is nearly cut through by the bracket of the projecting balcony above. A similarly unpleasant adjustment of solids and voids may be seen at the other end. The effect would be still worse than it is if 'tie-rods' had not been introduced, to satisfy the eye, at the springing of the arches.

The apportionment of void and solid is regulated by the size and purpose of the rooms on each floor; but where the voids or window openings are large they should be furnished with a proportionate amount of solid wall space on either side. This is admirably exemplified at Gwydyr House, Whitehall (Ex. 47). How dignified these large openings appear in their wide field of brickwork!

It will be readily understood that if the openings for light are unduly large a false 'scale' is set up, the apparent size of the building diminished, and the composition otherwise spoilt.

There are many ways in which large openings can be rightly treated so as to keep them in scale.



47. GWYDYR HOUSE, WHITEHALL.

They may be subdivided (often with great advantage to the general effect) either by columns or by mullions or by divisional bars and lead glazing. All these can be so ordered as to retain the right scale and due proportion of solid and void.

An example of the right treatment is seen (Ex. 48) in the delightful corner house No. 32 Soho Square (now a small hospital), where the maximum amount of window space is obtained, but so cleverly sub-



48. A HOUSE IN SOHO SQUARE.

The diagrams illustrate the arrangement of particles in three states of matter:

- Solid:** Particles are tightly packed in a regular, repeating pattern.
- Liquid:** Particles are closely packed but arranged in a disordered, irregular pattern.
- Gas:** Particles are widely spaced and arranged in a completely random, disordered pattern.



49. TRIBUNAL HOUSE, GLASTONBURY.

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divided by the columns as to preserve a just and uniform scale throughout. Contrast the effect with that of the adjoining house and its chilly sheets of plate glass.

Tribunal House, Glastonbury (Ex. 49), is a good illustration of the value of stone mullions for a similar purpose. The maximum amount of light is obtained



50. IN THE HAYMARKET.

—indeed, the front is nearly all window—and that, too, without any sacrifice of scale or proportion.

Plate glass has its proper place and use. In many kinds of shops, for instance, the unbroken surface possesses distinct advantages for the display of goods (*e.g.*, millinery), but there are other articles which gain in attractiveness by being distributed

rather than massed together. Who does not know and admire the tobacconist's shop at the top of the Haymarket (Ex. 50)? Beautifully proportioned and subdivided, it lends an attractiveness to its wares which would be impossible behind a large plate glass front.

It is often possible to see the old fashion of divisional bars and the new style of plate glass in large sheets side by side in the same house—to the obvious discrediting of the more modern way. That fine old mansion, Melton Constable, Norfolk (Ex. 51), is a case in point. The scale of the garden front is entirely spoilt by the loss of the old divisions in the windows, which, however, are still retained on the west side of the house.

Again, many an old country cottage marked by a row of small windows divided by mullions presents an appearance of size far beyond that of the typical suburban villa with its large sheets of plate glass. Yet the light provided in the former case is ample; indeed in many instances the actual glass area will be found to be proportionately the same in the two cases.

Compare, for instance, the window and wall area of the Court Farm, Worcestershire (Ex. 52), with the window spacing and glass area of the suburban house shown in Ex. 53—both of them three-storied houses.

In the projecting bay of the latter the ground floor is occupied by a large arched opening divided by wooden mullions, but above are two large plate glass windows and (in the same bay) side windows



51. MELTON CONSTABLE, NORFOLK.



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52. COURT FARM, BROADWAY, WORCESTERSHIRE.

also, leaving very little brickwork at the angle. In the gable over, as though one window in the centre were not sufficient to light the little room, two small



53. A MODERN SUBURBAN HOUSE.

ones have been introduced in the spaces left in the gable.

How unfortunately does this contrast with the Court Farm, or with such a house, common enough

in the country, as that illustrated in Ex. 54, where, without any sacrifice of ample light, not only has a properly proportioned wall space been retained but a general effect of size and homely beauty is achieved which is conspicuous by its absence in the case of the suburban house.



54. A COTTAGE, TONBRIDGE.

BALANCE AND SYMMETRY.

These factors give a distinctive character to a building, and aid in setting forth its special purpose.

An orderly and well-balanced arrangement of parts is suggestive of official and public life. A wide central entrance, with dominating tower or dome, invites attention to an important official centre.



55. SOMERSET HOUSE.



56. THE LOUVRE, PARIS.

Buildings of a public or semi-public character will generally be treated in the same symmetrical way—with a central block and flanking wings and an orderly array of columns and windows—with modifications and variations in which, however, there will generally be found balance and rhythm.

As an example of orderly and well-balanced arrangement, Somerset House (Ex. 55), seen from the Embankment, is a public building that we may well be proud of. Its contrasting subdivisions also, both horizontal and perpendicular, are eminently strong and well defined.

Even more admirable is the French example (Ex. 56), showing that portion of the Louvre which was either designed by the Florentine Bernini, or by the Frenchman Perrault under the influence of Bernini. (The Italian excelled in the treatment and effect of a colonnade, as has been already illustrated in Ex. 14.)

This splendid work possesses all the qualities and essentials of a masterpiece. Its perfect proportions will be recognised at once. The lower stage is subservient to the upper, and the quiet breadth and restraint displayed in it serve as a foil to the rich treatment and fluted Corinthian columns above. The columns, moreover, being detached and the wall behind deeply recessed, fine effects of light and shade are added to the beauty and grandeur of the whole composition.

A more extended example of fine balance and symmetry is to be seen at Greenwich Hospital (Ex. 57), where Wren's genius is conspicuously

displayed. Though two buildings were already on the site at considerable distance from each other, yet he designed and grouped others so as to bring them all into one harmonious whole of exceeding grandeur and stateliness. These buildings are in separate and distinct blocks, and unimportant parts and details may vary, yet so perfectly are they combined that the result is a marvellous example of balance and symmetry, the value of which cannot even be suggested in a mere view.



57. GREENWICH HOSPITAL.

CHAPTER IV.

MATERIALS.

MATERIALS, which are, of course, the primary factors in all building, may be roughly classed under the four heads :—

1. Stone.
2. Wood.
3. Metal.
4. Brick, cement, &c.

In each class will be found varying degrees of hardness, of coarse and fine texture, and other special characteristics, all of which, rightly understood, are guides to the true use and proper place of the material. The finer and more delicate kinds are out of place where strength and hardness should be the primary consideration.

For purposes of ornament, also, there are certain species of material which lend themselves more readily to beautiful work. The treatment which is quite suitable in one material is not necessarily so in another, even if the latter admits of it. Materials which can with advantage be cut or shaped by tools should differ in form from those cast in moulds, and so on.

Bearing this in mind it will easily be understood

that there are certain architectural forms suitable to each material and its varieties. These we will now proceed to consider.

STONE.

Under this head we consider for convenience every kind of stone, including granite and marble.

Granite has been called the "foundation wall of the earth." Its essential qualities are hardness and coarseness of grain, and even if it should be possible by improved mechanical means to mould or carve it like a softer stone, such a treatment would still be quite inconsistent with the true nature of the material. Its character marks it out for use in large and bold forms.



58. A KEYSTONE AT HAMPTON COURT.

Lime and sand stones exhibit different degrees of hardness and weight, and the forms proper to each vary accordingly. The number and character of the mouldings, for instance, should be regulated by the comparative coarseness or fineness of texture, and the amount of 'undercutting' in the carving by the hardness and durability of the material. When Grinling Gibbons, after achieving such beautiful forms in wood carving, proceeded to apply the same



59. CHOIR STALLS, CHIESA DEI MIRACOLI, VENICE.

treatment to stone, undercutting it in all directions and trying to adapt this material to the same delicate, minute forms as he had been used to labour at in his old sphere, he was doing violence to the true and essential qualities of the stone, which inevitably in course of time dropped to pieces.

The keystones to the arches of the ground-floor windows on the east front of Hampton Court Palace were Grinling Gibbons' work (see Ex. 58). The design is beautiful, but only suitable for woodwork. As a matter of fact, the stone breaks away and has periodically to be renewed.

Marble, in its fineness of grain, is the exact opposite of granite, and is capable of receiving the most delicate moulding and the most exquisite finish in carving. This is not equally true, however, of every kind of marble, for there are certain calcareous species which are not sufficiently compact to be moulded or carved to advantage.

Other kinds there are whose true use and place are indicated by the beautiful polish they can take or by the diversity of colour they exhibit.

Where the value of the marble lies in its 'figure' or colour it is more appropriately used for decorative purposes *in flat planes* as better calculated to display its beauty. When for any special purpose such marble is moulded large forms should be used, as the high lights which the smooth surface takes will disturb the 'figure.' These several uses of marble are illustrated at the beautiful Chiesa dei Miracoli, Venice (Ex. 59), where the carving of the

white marble and the panels of figured marble are well exhibited.

WOOD.

The considerations we have suggested in reference to the use of the various kinds of stone apply also in measure to wood, with this proviso, however, that whereas stone is granular in its nature wood is fibrous and lends itself most readily to long and thin forms, and lines that are suggestive of its natural growth, as so often and so beautifully illustrated in the canopied stalls in our cathedrals (Ex. 60).

Wood requires to be humoured. Grinling Gibbons' brilliant work in the carving of fruit, flowers, &c., in wood was not accomplished by haphazard methods. On examination it will be found that each flower, leaf and stalk or delicate tendril was carefully designed and placed to be cut according to the grain of the wood. The craftsman understood the needs and limitations of his material, except, as we have seen, when he tried to treat stone in the same way as wood.

There are many fine specimens of the work of Gibbons and his followers scattered about the country. Belton House contains some good examples (Ex. 61).

The toughness and density of wood must be considered in determining the character and size of details and mouldings.

Hard woods allow of sharp thin lines, and therefore of small and delicate mouldings, which would be impossible in a softer material.

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61. PART OF THE ORGAN GALLERY, BELTON HOUSE, GRANTHAM.

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There are certain kinds of wood as there are certain kinds of marble, whose beautiful grain and figure is best reserved for decorative purposes and exhibited in boards and panels, with simple forms and few mouldings.

METALS.

The different metals, like the several kinds of stone and wood, should be used in accordance with their natural characteristics, which are for the most part matters of common knowledge. The essential qualities of each metal should be recognised and brought to the front, as it were, for the best use.

But in considering metals a new element of interest and importance is introduced, in that they can either be 'wrought' or 'cast,' and each kind has both its appropriate forms and its suitable positions.

In wrought work the metal is fibrous and elastic, and can be drawn or beaten out, whereas cast work is granulated and brittle.

The metal can either be wrought into delicate and beautiful forms under the workman's hand, thus acquiring a distinctive quality of its own, or it can be poured into moulds; in which latter case it necessarily and rightly assumes more bulbous forms, and, as being further removed from the human touch, is to that extent of less interest and value. Nevertheless, each kind has its proper place, and, when used with judgment, its characteristic beauty and fitness.

Compare the wrought-iron gates at Hampton

Court (Ex. 62) with the cast-iron gates at the Royal Exchange (Ex. 63), or the cast-bronze gates at the Loggetta, Venice (Ex. 64), with the wrought-iron gates in front of the Duke of Devonshire's house in Piccadilly (Ex. 65), and the distinctive merit of each of the two kinds will be recognised and appreciated, for in each case the treatment is true and correct.

Or, in the matter of iron railings, by contrast with the wrought metal to be seen at Great Ormond Street (Ex. 66) and in many of our London squares, we shall acknowledge that the forms of the railings around St Paul's Cathedral (Ex. 67) and the British Museum are wonderfully suitable to cast work and appropriate to the monumental character of the respective buildings.

As already indicated, the test of fitness in this matter of wrought work and cast work is twofold. The form of the work as well as its position is to be considered and weighed, and should a doubt at any time arise as to whether what we see is wrought or cast, it is quite certain that the design is faulty.

Wrought-metal mouldings are naturally attenuated and thin, and are chiefly to be observed in the more delicate and refined metals used in the interior of buildings or in architectural accessories. Whether the mouldings be cast or wrought, they naturally vary slightly according to the temper of the metal.

Lead, as a soft metal, was in great demand at one time, both for the finer order of castings and also to be cut and bent to special forms.

Many a beautiful fanlight which may still be seen



62. WROUGHT-IRON GATES AT HAMPTON COURT.

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63. CAST-IRON GATES AT THE ROYAL EXCHANGE.

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64. THE CAST-BRONZE GATES OF THE LOGGETTA, VENICE.

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65. WROUGHT-IRON GATES, DEVONSHIRE HOUSE, PICCADILLY.





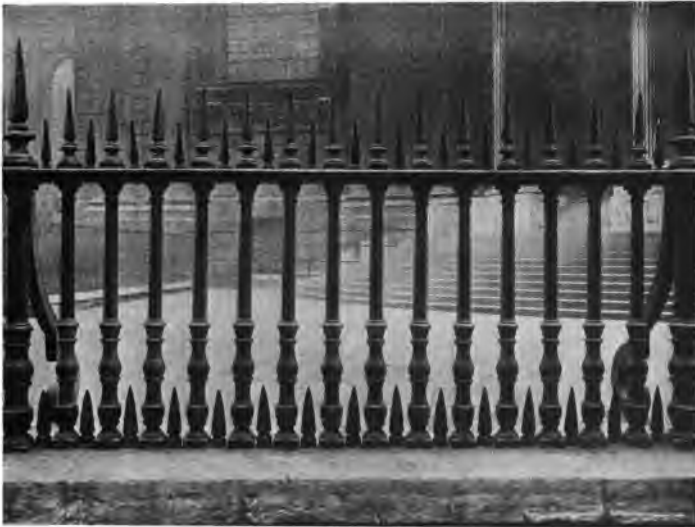


66. WROUGHT-IRON GATES, 44 GREAT ORMOND STREET, BLOOMSBURY.



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over some eighteenth-century door (Ex. 68) could scarcely have been carried out in any other metal. Many a delicate staircase balustrade also, which, being painted over, has been generally supposed to be of iron, will be found on examination to be cast in lead.



67. CAST-IRON RAILING, ST PAUL'S CATHEDRAL.

All metals deteriorate more or less when exposed to the weather, especially such as, like iron, corrode quickly. When used constructively it is absolutely necessary that they should be protected by paint or other means.

Even so, iron railings, which have been regularly painted for fifty years, will often be found to be eaten

away to a mere thread at the bottom where the moisture settles most.

This is only one illustration of the scientific or technical side to the right and best use of materials. There is no need to go very far in search of other examples. Stone, if not laid as on its natural bed in the quarry, will flake off on the exposed surface. This accounts for the dilapidated appearance of certain buildings at Bath and at Oxford.



68. FANLIGHT, MANSFIELD STREET.

Wood, again, must not be enclosed; otherwise it is liable to dry-rot.

Such matters as these, however, concern the architect and the builder rather than the public, who can scarcely be expected to make themselves acquainted with such technicalities.

BRICK, TERRA COTTA, CEMENT, &C.

Bricks, which, unlike stone, are of a fixed size, are sometimes used alone, but more frequently in

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69. HONINGTON HALL, WARWICKSHIRE.



70. HOUSE AT HERTFORD.

conjunction with stone. In the latter case, the stone should be accorded the more honourable part. It would not be correct, for instance, to put brick quoins (viz., corners or angles) to a stone building.

Quoins, architraves to windows and doors (to frame them), sills to windows, cornices, and string-courses—these are the appropriate parts for stone when used in conjunction with bricks. 'Honington Hall, Warwickshire (Ex. 69), is a red brick house, with stone quoins, stone dressings to frame the windows and doorway, stone niches for the busts, and a stone plinth running around at the base. The effect of stone thus freely distributed on a ground of red brick is very pleasing to the eye.



71. THE GATEHOUSE, EAST BARSHAM, NORFOLK.

There are hard kinds of brick and soft kinds. The latter (technically known as 'rubbers') are often

used for arches and architraves, being cut or rubbed to the required shape. Many beautiful examples of such work may be found (see Ex. 70), but the practice is not to be commended; for a sense of fitness teaches us that the stronger material should frame the softer, and a violation of this principle provokes a feeling of incongruity. In many old houses this difficulty is got over by building the



72. TERRA-COTTA FRIEZE, EAST BARSHAM.

whole in soft facing bricks. There is this disadvantage, however, about the soft bricks,—they are not impervious to wet.

There are other kinds of moulded clay as well as baked clay (terra cotta) which have their proper place and use, and which, when employed rightly in conjunction with constructive materials, may be most decorative in effect.

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73. THE CERTOSA, PAVIA.

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74. THE PALAZZO PODESTA, GENOA.

East Barsham gateway (Ex. 71), like other parts of the manor house, is a good example of the right use of terra cotta. The main building is faced with red brick, the terra cotta being reserved for the decorative features. In the gateway the arms and supporters are terra cotta, the background being filled in with brick. The enlargement of a portion of one of the enriched string-courses (also terra cotta) is given (Ex. 72).

The Certosa at Pavia (Ex. 73) is also a good example, although, as Mr Norman Shaw has pointed out, many of the forms there adopted, while quite suitable to terra cotta, would have looked still better carved in marble.

When, however, terra cotta is used to imitate stone construction and pretends to be solid, or when it is made to look like marble, it offends against the truth. If used alone, it should be seen clearly to be what it is—a mere skin or covering to the steel structure behind.

Cement cast in various forms is employed to cover the face of (mostly) inferior materials. Provided, however, that there is no pretence to be stone, its use is not to be despised, for it serves as a very useful ground for colour treatment.

The Palazzo Podesta, Genoa (Ex. 74), is a good example of the use of plaster (or a kind of marble cement) for surface decoration work, which in this case remains as clear and sharp as when executed more than three hundred years ago. The Palazzo Spada, Rome (Ex. 39), is also a noted example of the same kind of work.

Other kinds of surface treatment there are—mere coverings serving as decorative mediums for colour or mosaic work—whose purpose cannot be misunderstood.

Finally, there are other materials, as glass, slate, roof tiles, &c. &c., whose use, being limited and dominated by constructive needs, calls for no special comment or illustration.

The foregoing observations and suggestions are not put forth as in any way exhausting the subject, but as indicating a mode of analysis and a line of inquiry which, the author is assured, will prove very fruitful of results to all who care to pursue the study still further.

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